## Irrigated Pulse Agronomy

Drainage was the key to a successful trial. Irrigated lentils and chickpeas could be quite profitable, assuming that the current prices are maintained. In 2017, pre-irrigation alone was sufficient moisture to grow the crop successfully. Spring irrigations did not improve either yield or grain

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Growing irrigated chickpeas and lentils has potential financial rewards but their reputation for susceptibility to waterlogging and disease potentially makes them a risky proposition. Advances in irrigation technology and infrastructure may have reduced some of the risk. The ICC is attempting to quantify the risk with trials that have a combination of irrigation technologies, irrigation and fungicide strategies and variety evaluation.

Trials consisting of 4 varieties of lentils and 4 varieties of chickpeas were sown at three locations – ICC Trial Block Kerang, (border Check), Appin (subsurface drip) and Dhuragoon (near Moulamein, NSW, overhead spray). All sites were grey clays (vertosols). Each site had a combination of irrigation strategies and fungicide strategies.

	Irrigation Strategy			
Layout	Pre-irrigation Only	Pre-irrigation + spring to flowering	Full Irrigation	
Border check	$\checkmark$	$\checkmark$	$\checkmark$	
Subsurface drip		$\checkmark$	$\checkmark$	
Overhead Sprays		$\checkmark$	$\checkmark$	

Table 1: Irrigated pulse trial irrigation infrastructure and strategy.

Overlaid on each site are 2 fungicide strategies – strategic (applied only when disease pressure is high) and blanket (regular application every 3 weeks).

Varieties used, target population (plants/m<sup>2</sup>) and sowing rate (kg/ha) at each site:

	Variety	Target pop'n	Sowing Rate
Lentils	Bolt	120	66
	Jumbo2	120	82
	Giant	100	94
	HurricaneXT	120	53
Kabuli	Genesis 090	35	159
Chickpeas	Almaz	35	206
Desi	Boundary	45	135
Chickpeas	Slasher	45	194

## Part 2 Overhead Sprays

A similar trial to that conducted at the Trial Block was sown on June 1<sup>st</sup> due to the site being too wet following pre-irrigation and rain in mid-May. Initial grass control was poor from using 500 ml/ha Select on July 21<sup>st</sup>. Following confirmation of the poor result, a second attempt was made on August 18<sup>th</sup> using Factor (180 g/ha). Only partial control was achieved and the trial suffered from high ryegrass numbers.

The fungicide program started on July 21<sup>st</sup>, with 1.5 kg/ha Mancozeb applied to all plots.

The "3 week" treatments then occurred on 9/8, 31/8, 19/9, 29/9 and 10/10 using Chlorothalonil at 1.5 l/ha – a total of 6 fungicide applications for the season. The "strategic" treatment commenced on 21/7, with further applications on 31/8 (rain), 29/9 (irrigation) and 10/10 (rain) – a total of 4 applications.

No disease was detected in any plots during the season.

However areas of poor drainage became apparent in early September, with less biomass, and became worse with poor growth and yellowing of the foliage as the spring progressed.



Lentils late September.

## Results Grain Yield

Irrigations past the commencement of flowering did not affect yield. The table below incorporates data from both the "up to flowering" and "full" irrigation treatments. Fungicide strategy did not have any effect on yields.

		Yield t/ha	
Variety	Туре	3 week	Strategic
Almaz	Kabuli Chickpea 1.90 1		1.58
Boundary	Desi Chickpea	2.63	2.27
Genesis 090	Kabuli Chickpea	2.35	1.99
Slasher	Desi Chickpea	2.41	2.21
	p=0.083	NS	
Hurricane XT	Small red Lentil	2.54	2.04
Jumbo2	Large red Lentil	1.72	1.70
Bolt	Med red Lentil	2.00	1.90
Giant	Large green Lentil	1.45	1.24
	p=0.141	NS	

## Seed Size

Neither irrigation nor fungicide strategy made any difference to seed size.

Chickpeas	Almaz	Boundary	Gen 090	Slasher
g/100 seeds	36.3	16.6	29.0	28.3
Lentils	Bolt	Giant	HurricaneXT	Jumbo2

6.6

What does it mean?

g/100 seeds

Drainage is king. Despite smaller and more frequent irrigations, plant damage (yellowing and poor vigour) and death was much higher at this site.

3.4

4.7

Ryegrass competition was a factor in the poorer yields.

2017 was a low disease season which saw little benefit from a more frequent fungicide strategy.

Irrigation did not seem to be detrimental, however yield was not significantly improved by any spring irrigation past flowering. Bear in mind the soil profile was almost full at the end of August 2017. If this reserve had not been in place, there may have been a response to spring irrigation.

Thanks to Michael Gorey for hosting the trial.

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